

Remarks

The applicants appreciated the opportunity to discuss this case in detail with the Examiner by telephone in the interview November 22, 2006. In this case it seemed to work well to enable more rapid understanding of each other's reasoning. In the telephone discussion the Examiner asked applicants to confirm in writing their explanation of the term "link aggregation", and why it cannot be interpreted so broadly as to encompass the switches used in fig 7 of Chi to multiplex OC-12 lines into a single OC-48 line. This leads inevitably to the conclusion that claim 1 cannot be obvious over Chi.

Link aggregation appears twice in claim 1, firstly to specify that the node has a link aggregation router connected to two paths, one of which is a shared protection path, and secondly to specify that link aggregated traffic is carried simultaneously on both paths without duplication, when in failure free operation.

As the Examiner has noted, Chi shows a shared protection line 605 in fig 6, and shows sharing the protection line between different SONET rings, by allocating different time slots to different rings. Different parts of the ring may be made up of multiple OC-12 lines or a single OC-48 as shown in fig 7, so switches in the ring can have a SONET multiplex function or SONET de-multiplex function to connect a span of OC-12 lines to a span of OC-48.

This is only relevant to claim 1 if the switches of Chi can be regarded as link aggregation routers and if both working and protection paths carry link aggregated traffic. As discussed during the interview, link aggregation is a well known term which is defined in the specification as follows:

"Link aggregation is a method of grouping physical link segments of the same media type and speed, and treating them as if they were part of a single, logical link segment." (page 5 line 6)

This definition continues with the explanation that

“If a link in a trunk fails, the flows mapped to that link are dynamically reassigned to the remaining links of the aggregated link.” (page 5 line 12)

The Examiner acknowledged that the broadest reasonable interpretation of the claim cannot ignore such an explicit definition in the specification. The definition follows the established use of the phrase and so merely reinforces the interpretation that a skilled person would use anyway.

The SONET switches of Chi are multiplex/ demultiplex switches, which is not the same as link aggregation as defined here. The SONET multiplex switches do not “group physical physical link segments of the same type and treat them as if they were a single logical link segment”. The SONET multiplex switches do take the signals from multiple OC-12 lines of one span and convert them into OC-48 for transmission in the next span. This is not link aggregation. The concept of link aggregation is not the same as the concept of multiplexing lines of one span into a multiplexed second span. Link aggregation would correspond to treating the span of OC-12 lines as an OC-48 span, with dynamic allocation of flows between the OC-12 lines, if this were possible. It is apparent that link aggregation is a fundamentally different concept than multiplexing as used in SONET, and is not interchangeable. Chi does not do this link aggregation nor hint at it.

The shared protection path in Chi does involve reallocation of traffic in the event of a failure, but this reallocation does not meet the definition of link aggregation which is “reallocation to the remaining links of the aggregated link”. In Chi, the reallocation is not to the remaining links, but is to an alternative line, the protection line, or at least some of the time slots on that protection line, kept free for this purpose.

Furthermore Chi does not show the second mention of link aggregation in claim 1, the link aggregated traffic being carried on both the working path and the shared protection path, during failure-free operation. Chi does not discuss what is carried on the shared protection path during failure-free operation, but even if it

implied that some SONET multiplexed traffic were carried, this is not link aggregated traffic as defined above. Such link aggregated traffic is flows which are mapped to a group of physical link segments of the same media type and speed, treated as if they were part of a single, logical link segment, and dynamically reassigned between the links in the event of failure.

Regarding obviousness, given the explanation above of the fundamental distinction between link aggregation and SONET multiplexing, it should be apparent that these two techniques are not interchangeable, since they serve completely different purposes. Hence there is no incentive for a skilled person to alter the SONET multiplexing with shared optical protection of Chi to reach the present invention. As explained in previous responses, optical protection schemes would normally be handled at the link level and thus operate independently of any link aggregation router. Hence there is nothing in Chi which leads towards the unusual step of incorporating a link aggregation router into an optical shared protection scheme as set out in the present claim 1. Nor is there any incentive to use the shared protection path for link aggregated traffic. This has the consequence of more efficient use of bandwidth and there is no longer a need to pre sort the traffic for the optical link into protected and unprotected traffic, as the router is capable of doing this. Hence some of the advantages of link aggregation and of shared protection paths can be achieved more efficiently by using the same router for both schemes. There is no suggestion in Chi of this, and no suggestion of using its router to separate traffic between a shared protection path and a working path. Nor is there any hint of the advantages arising. Hence Chi is not relevant to claim 1, when its terminology is properly interpreted.

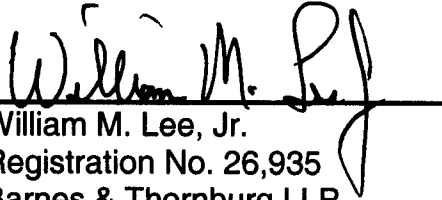
All the other claims have corresponding features or are dependent on such claims, and so these arguments apply to all claims.

An appropriate Petition for Extension of Time is also submitted herewith.

All the points raised have been dealt with, all the claims are submitted to be allowable and reconsideration is requested.

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Respectfully submitted,



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